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The Automobile

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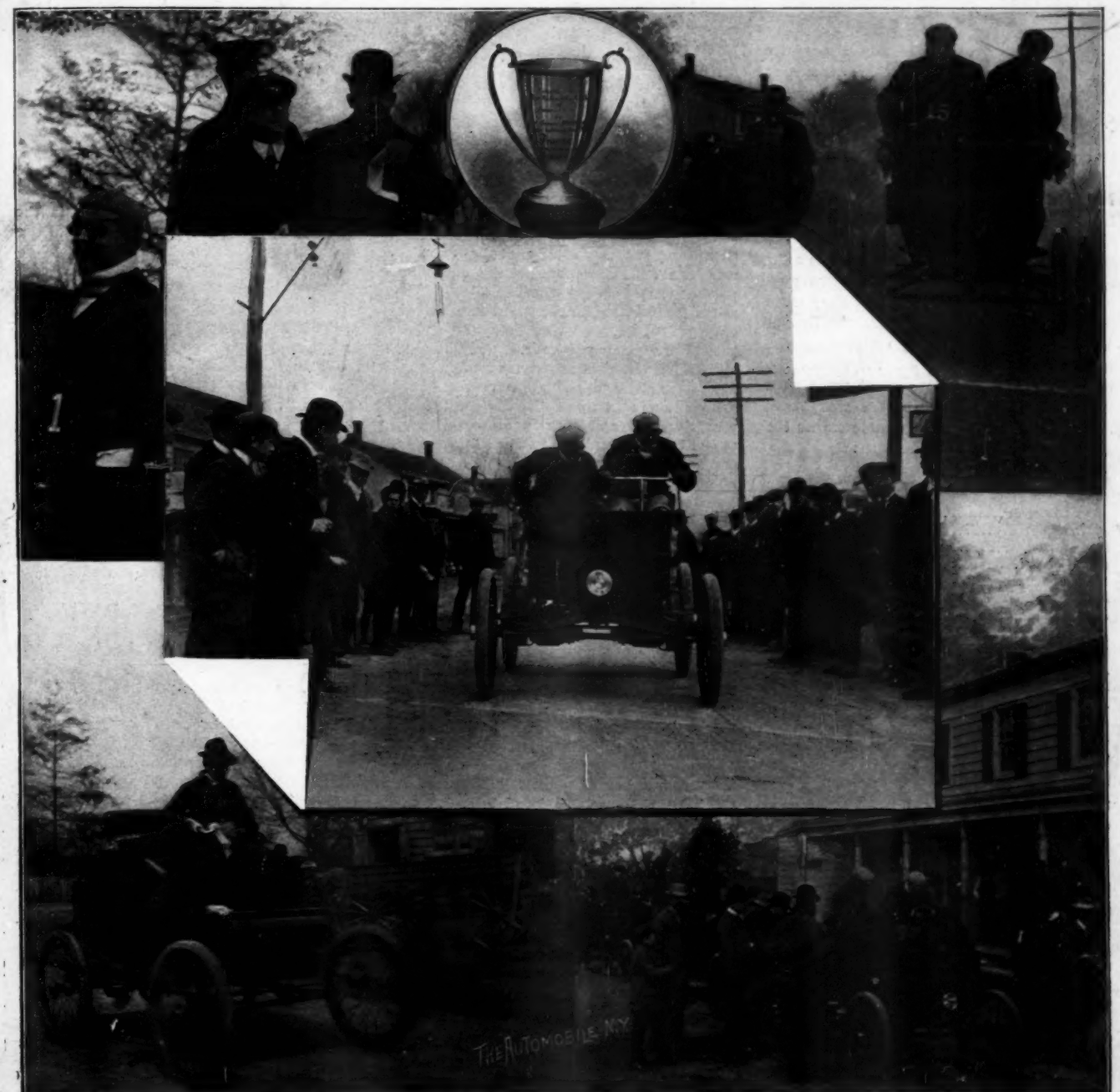


Mr. Lyon, Starter. Mr. Bostwick, Race Committee. Mr. Fisher, Third.

The Cup. Mr. Riker, the Winner.

Mr. Davis, Second. Lining Up for the Start.

THE FIRST AUTOMOBILE CLUB RACE.

The First Club Race.

On Saturday, April 14th, was held the first race of the Automobile Club of America. The course selected was from Springfield, Long Island, to Babylon and return, a distance of about fifty miles. There were nine competitors ready when Mr. A. C. Bostwick, Chairman of the Racing Committee, announced the rules governing the different parts of the course. Mr. Whitney Lyon acted as starter, taking up his position on the line in an elegant electric dos-a-dos.

There were some twenty-five or thirty automobiles of various kinds about the starting and turning points. The majority were steam phaetons, but several quadricycles, a Hertel, a Daimler wagonette and Winton's were to be seen. An electric delivery brought supplies, and every facility had been provided for the participants. No part of Long Island had been quite so favored before with automobiles as Springfield and vicinity on this occasion.

When the automobiles lined up one after another there was one electric, five gasoline and three steam vehicles. They were sent away thirty seconds apart, the first at 10.24, and were soon lost to view over the hill to the east. Through the aid of the telephone those at Springfield were kept informed of the way the race was being fought out. The following table shows the standing as they made the turn:

Time for Twenty-five Miles.

		Hrs.	mins.	secs.
S. T. Davis, Jr.	Steam	0	58	15
A. L. Riker	Electric	1	00	38
D. H. Morris	Steam	1	01	45
A. Fisher	Gasolene	1	06	44
D. Wolfe Bishop, Jr.	Gasolene	1	13	10
A. C. Bostwick	Gasolene	1	17	03
G. F. Chamberlin	Gasolene	1	18	58

Time for Fifty Miles.

		Hrs.	mins.	secs.
A. L. Riker	Electric	2	03	30
S. T. Davis, Jr.	Steam	2	18	27
A. Fisher	Gasolene	2	30	01
D. Wolfe Bishop, Jr.	Gasolene	2	30	01
A. C. Bostwick	Gasolene	2	46	40
G. F. Chamberlin	Gasolene	2	48	42

The prizes were a silver cup to the first and diplomas to the second and third. The cup bears this inscription:

Presented to
The Automobile Club
of
America
by
Mr. Leonce Blanchet,
of the Automobile Club of
FRANCE.
Fifty-Mile Road Race.
1900.

It is a real trophy cup, gold lined, mounted on an ebony base. It has been on exhibition for some days at the Automobile Club. The race was open to any vehicle except tricycles, must carry two persons, and be driven by a member of the club.

Comments on the Race.

There have been so many erroneous statements made concerning the victory of my carriage in the fifty-mile road race April 14, 1900, that in order to do the electric vehicle justice I consider it my duty to refute them by giving the facts in the case. The carriage that I drove in the competition has been called a racing machine, and I have been criticised for entering a speed contest with a fast vehicle. Again it has been stated that the batteries were ruined; also that I changed them en route, replacing the exhausted cells with fresh ones, and other such statements about as sensible. For sake of argument, let us assume that they are true. There was no stipulation that the carriage should be slow, or that they should not stop to replenish their power during the run. Therefore, such statements as the above are foolish, and can be dismissed without further comment; but before leaving them I will say that the batteries were not ruined, and that I did not change them, and further, after making the fifty-mile run with the same cells and without re-charging, I drove the carriage twenty miles further, making a total run of seventy miles, fifty of this being at almost twenty-five miles per hour. This, you must remember, was made with a carriage whose weight was a little over two thousand pounds complete. Of this amount nine hundred and sixty pounds were due to the battery, and I consider it a most remarkable performance for such weight of cells.

As a short description of the carriage may be of interest, the following are some of the principal features: The vehicle is of the piano box type of body, carried on my flexible running gear, two motors of three horse-power each are connected by spur gearing to the rear wheels and steering is accomplished by swiveling the front wheel over the line of tread. These wheels are in turn connected to the steering bar, which resembles the handle bar of a bicycle, by a system of levers. The wire wheels are 32-inch front, 36-inch rear, with 3-inch pneumatic tires pumped to 125 pounds per square inch. A controller with a number of speeds is operated by the central lever. A hand-brake, which can be operated by either occupant as well as the foot-brake, were found necessary to check the carriage for the runner. ous bridges and railroad crossings.

The course, as you are aware, was over the famous Merrick road from Springfield to Babylon and return, making a course of fifty miles, all but twelve being over very good roads. The twelve-mile stretch was miserable, being sandy and very heavy from the fact that they were mending it, so that we had to slow down to about eighteen miles per hour while going through it.

As I started first, and turned the mark at Babylon in this same position in one hour and thirty-eight seconds, I was quite anxious to know whether I had gained or lost on the road out. As I started on the home stretch I met the other contestants coming out, and found that I had lost two minutes to Mr. Davis, but as the run out had been made before a twenty-mile an hour wind, and as we had been running less than half speed, I was not greatly worried as to the outcome unless I had some accident. Into the head wind we raced at about the same speed as on the journey out, but to accomplish this we had to develop fifty per cent. more power. The run back was made without incident in one hour and three minutes, having gained some twenty miuntes over the second carriage. Within a couple of hundred yards of the finish I gave the carriage the full power and crossed the line at about forty-five miles per hour. And then what an ovation. Those who had scoffed at an electric carriage running fifty miles, let alone winning such a contest, were dumbfounded, and changed their minds as to the chances of the electric against steam and gasoline for a race of this distance.

In conclusion, I trust that there will be other opportunities offered to again try conclusions with steam and gasoline against the electric carriage.

A. L. RIKER.

The "Locomobile" which I used in the automobile race of Saturday, April 14th, was one of the standard style No. 2 vehicles built by The "Locomobile" Company of America. It was not a special carriage, as some people seem to think. It worked beautifully from start to finish, and travelled the first 18 miles over good roads in slightly less than half an hour. The very bad seven miles of road just before getting to Babylon not only stopped our speed considerably, but also made it necessary to take an extra tank of water.

If road rading were to become prevalent in this country as it is in France, it is possible to build a steam carriage that could run 100 miles or more without making a stop. Such a vehicle would have great power, and could run at a rate of speed limited only by the courage and skill of the operator.

S. T. DAVIS, Jr.

The first road race of the Automobile Club of America can not properly be called a race, as only one racing carriage was entered, the electric carriage. Mr. Riker's carriage proved to be a wonder, and he deserves great credit for its good performance. With this special machine competing with the others, which were ordinary pleasure vehicles, there could be only one result. As a true race the result can not be considered as showing the relative merits of the different systems; but as a run of the club it showed without question that the gasolene carriage is to-day the most reliable carriage for long runs.

Of the five gasolene carriages entered none were fast carriages. Their owners did not expect them to make fast time, as they had not been built for that purpose. They did prove conclusively that they could make the trip of fifty miles without the slightest accident. The gasolene enthusiasts can feel proud of the result. Perhaps by fall this country will produce a gasolene racer, and if it should prove to be as fast as some of the French machines, that is, forty-two miles an hour, it is very apt to distance all its competitors.

A. FISHER.

A Six-Hundred Mile Tour.

Mr. George Isham Scott, a member of the Automobile Club of America, made a tour with his locomobile last month of more than six hundred miles. Leaving New York Monday, April 4th, he reached Philadelphia at evening, finding the roads fair and the machine running to perfection.

A SIX-HUNDRED MILE TOUR.

From Philadelphia to Havre de Grace, on the Susquehanna, the roads were very rough and difficult, but the trip was made without mishap. The evening of the third day out of New York found him in Washington, where he remained three days. The cylinder head and steam chest needed repacking, and this was done while in Washington.

From Washington to Baltimore and to Havre de Grace the roads were deep with mud, and extreme care was necessary to bring the wheels, that often settled to above the hubs, out of the chuck holes. In turning a corner in Baltimore a wheel came too close to the curb, and a visit to a repair shop was necessary to have the eight damaged spokes replaced. From Philadelphia back to New York everything ran well, and over a twelve-mile stretch alongside the railroad a little brush with the train was one of the pleasant diversions. The train came in a minute and a half behind the automobile.

Mr. Scott and his brother, who accompanied him, expressed themselves as having thoroughly enjoyed the ten days' tour.

German Post Office Test.

German Postal authorities have conducted a series of tests of gasoline and electric postal automobiles. The results have not been as successful as might be desired, but to an American it will not seem strange that heavy iron-tired vehicles did not prove any more satisfactory.

The Century Electric Runabout.

The very neat and stylish-looking electric runabout shown herewith has been recently completed by the Century Motor Vehicle Co. of Syracuse, N. Y. The vehicle is driven by a pair of bevel gears on the rear axle, the motor being suspended from the forward part of the carriage body. A double reduction system of gearing is used, there being a pair of spur gears at the motor end of the gear shaft in addition to the bevel gears on the rear axle.

The frame is constructed entirely of seamless steel tubing, and is flexible to allow for inequalities of the road. Ball bearings are used throughout. The entire driving mechanism is enclosed and is perfectly dust proof. The electric battery is made up of 42 cells arranged in six trays, and the connections through the controller is such as to give three speeds forward, three backward and a stopping point between. The motor has been specially designed by the company's engineer and is built at its factory, as is the controlling mechanism, etc. The automobile is steered and controlled by one steering lever. The band brake is applied by a pedal.

THE CENTURY ELECTRIC RUNABOUT.

Engines for Automobiles.

Engines vary greatly in design, but the style most used in steam carriages is the slide valve engine. The slide valve is a much used and well tried device, and is to be recommended on account of its simplicity. The conditions in a steam carriage differ considerably from those in a locomotive or in a stationary engine.

First: In regard to resistance. The stationary engine has to overcome in addition to the regular work the frictional resistances of its parts. The locomotive has this resistance and three more, i. e., air resistance, grade resistance and resistance to traction. The steam motor carriage has these same resistances, only the resistances to traction is greater, and heavier grades than existing railways have to be often climbed.

Second: Economy. This is of prime importance in a locomotive, but not so necessary in a steam automobile; it is very important, however, to obtain absolute safety and freedom from noise, heat, odor and vibration.

Third: Size of parts. We may compare the steam automobile to a model of a locomotive. It is not to be supposed that the same conditions obtain with a model as with a full-sized engine. It is evident, therefore, from the above reasons roughly sketched in that the conditions must carefully be observed in the study of the steam automobile.—From recent paper by Mr. Kingman.

Lecture by Prof. Thurston.

The Automobile Club of America at its meeting Saturday evening, April 28, listened to a very interesting address by Prof. Thurston, of Cornell University, and an honorary member of the club. After being introduced by Vice-President Chamberlin Prof. Thurston reviewed the early history of the automobile, and gave an idea of the perfection attained in the early thirties in the construction of steam vehicles that was probably new to many of his hearers. He pointed out that the line of steam automobiles had not been broken from that day to this, and recalled a ride he took in a steam automobile about 1860, going out from Boston for a half day's trip; also the vehicle built by Roper and the steam fire engine built by Ericson, which was propelled by its own power and even made the trip from New York to Philadelphia.

The different kinds of power now receiving attention were considered, and steam, electricity and gasoline has each a place, but compressed air cannot at the present time compete with the heat motors in economy, and liquid air can compete to an even less extent. He gave some interesting facts regarding the construction of automobiles, and the properties of the metals used in their construction. In conclusion he said that the automobile can now be operated with no more danger than the horse-drawn vehicle; a greater range of speed is obtained, and the length of the route is unlimited with certain kinds of power; it operates equally well on all kinds or roads with the horse-drawn vehicle; in construction there is less liability to derangement and breakdowns; its cost and maintenance is less than the horse-drawn vehicle; it is to be preferred from a sanitary point of view; its tires will improve the road where the hoofs of the horse injure, and the automobile has also the advantage of more quiet running.

The Goodsell Bill.

The bill introduced in the New York State Legislature by Senator Goodsell has become a law. It authorizes any corporation that has operated a stage route continuously for five years last past, in any city of the first class (New York or Buffalo), to extend its routes in any direction without further authority than the approval of the State Railroad Commissioners.

This bill applies in New York only to the Fifth Avenue Coach Co. The new law furthermore gives this company the right to charge a fare not exceeding 10 cents per passenger for a continuous ride over the whole or any part of the routes owned or operated by it. The company must pay a license fee to the city equal to the charges now in force for licensing similar stages and omnibusses and it must also pay to the Comptroller of the city 5 per cent. per annum of its gross receipts.

The electric automobiles which have been tried on Fifth Ave. are but the forerunners of more commodious vehicles soon to be placed in regular service. The fare will probably be ten cents, as the service is special, but may be reduced after the routes are well established.

A bill passed last year gave to the General Carriage Co. rights similar to those now granted in the above bill.

Racing Time Nice-Marseilles.

At the recent meet at Nice some very fast time was made by the competing automobilists in the various events. Especially noticeable is the record of 96 kilometres (about 60 miles), which is the distance from Nice to Marseilles, in 104 minutes by an automobile carrying six persons. The records for the several classes on this run are as follows:

CLASS A.

Motor-Cycles, Motor-Bicycles and Voiturettes Not Exceeding 250 Kilogrammes.

	First day. H. M. S.	Second day. H. M. S.	Total. H. M. S.
1. Flores	2 37 37	2 55 22	5 32 59
2. G. Richard	3 13 27	3 5 46	6 19 13

CLASS B.

Voiturettes Not Exceeding 400 Kilogrammes.

	First day. H. M. S.	Second day. H. M. S.	Total. H. M. S.
1. Ravenez	2 34 47	2 19 42	4 54 29
2. Cornillean	3 11 3	2 38 17	5 49 20
3. Prenil	3 16 12	3 5 9	6 21 21

CLASS C.

Cars Not Exceeding 1,000 Kilogrammes. 4 Places.

	First day. H. M. S.	Second day. H. M. S.	Total. H. M. S.
1. Chauchard	3 31 25	2 14 6	4 45 31
2. Liebig	3 5 32	2 25 34	5 31 6
3. Cuénod	3 15 12	2 55 29	6 10 41

CLASS D.

Cars Exceeding 1,000 Kilogrammes.

	First day. H. M. S.	Second day. H. M. S.	Total. H. M. S.
1. Stead	2 14 0	1 44 0	3 58 0
2. Valton	2 33 0	2 43 58	5 16 58
3. Bergeron	2 32 7	3 17 31	5 49 38
4. Audibert	3 0 33	2 51 19	5 51 52

Edmond Motor Cycle.

The accompanying illustration shows a motor bicycle recently built by E. J. Edmond, of Matteawan, N. Y. The frame was constructed to give a greater space in front of rear wheel, and in this space the motor is mounted. The power is transmitted by both chain and gear, as shown. The spark coil is suspended above the motor and the muffler in front and below the cranks.

The pedals perform simply the duty of foot rests, being fastened in the position shown. The motor is started as one mounts, and for tough pieces of road the motor is thought to be sufficient in power to carry the rider. From the upper bar is suspended the batteries for the electric ignition and the fuel tank. The lever for varying the time of ignition is placed just beneath the seat.

THE EDMOND MOTOR CYCLE.

The Cleveland Automobile Club.

The automobile club of Cleveland seems to be one of the most progressive of those recently organized. The club was incorporated on Jan. 11 of the present year. The officers are: E. L. Strong, president; Geo. L. Weiss, vice-president; Windsor T. White, treasurer, and L. H. Rogers, secretary. The constitution and by-laws have been published in pamphlet form, convenient for the use of the members. There are four classes of members—honorary, life, active and associate. The active membership is limited to 150 with an initiation fee of fifty dollars and yearly dues of fifty dollars.

Columbus Club.

The most recent automobile club, whose organization has been effected, is the Automobile Club of Columbus, Ohio. The charter members are S. P. Hempstead, Oscar Lear, Dr. C. M. Taylor, Dr. Schueller, Campbell Crittenden, H. M. Gates, T. Midgley and H. B. Armstrong.

Two traction automobiles of the style described in THE AUTOMOBILE for December, 1899, have recently been shipped to Siberia by the California builders. These large traction automobiles are to be used in connection with the Trans-Siberian railway in hauling wagon trains of merchandise, etc. As described in the above-mentioned article, these automobiles are of fifty horse power, and will haul from thirty to fifty tons.

Charging Stations on the Jersey Coast.

Automobile stations have been established at Seabright, West End (Long Branch), Allenhurst, Spring Lake and Atlantic City. At these stations, maintained by the New Jersey Elec. Veh. Trans. Co., Columbia automobiles owned by private parties will be cared for. These stations will afford accommodations for parties visiting the summer resorts and will permit extensive driving. Wagonettes and omnibuses can also be obtained for parties wishing to make trips through the surrounding country.

The Quick Automobile.

The automobile shown herewith is one built by the Quick Mfg. Co., of Newark, N. J., which makes a specialty of gasoline motors for automobiles. This carriage is equipped with one of these motors, which is two cylinder water cooled. It is of four horse power at 700 revolutions per minute. Ordinary gasoline, 74 degrees, is used. The igniter is of the snap type, one to each cylinder, and the points are faced with an igniter point composition. The valves are operated from shaft across cylinder cover, driven by chain from sprocket wheel on crank shaft, and miter gears on the valve shaft drives igniter.

THE QUICK AUTOMOBILE.

Road Building in Ontario.

It is pointed out by the Provincial Instructor on Public Highways that although thirty million dollars and eleven million statute days of labor have been expended during the past ten years, and much of this money is expended in useful work, a very large part is absolutely wasted, owing to faulty administration, careless and inexperienced supervision and improper influences effecting the character of the methods employed. The Instructor advocates a system of money tax as a substitution for statute labor, as the latter usually results in temporary and perishable work. He points out that the cities should assist in making the country roads; for if we contrast an 80-acre farm with a 50-ft. town lot, and a farm road at $1,000 with a city street at $5,280 per mile, we find that the cost to the individual farmer is $125, as compared with $25 for the city property owner. Though city streets often cost more than this sum, so do the country roads.

The Paris Racing Program.

The races to be held this summer at Paris during the time the Exposition is open are to be under the auspices of the Automobile Club of France.

Committees—Special Committee of Consultation, M. Forestier, Chairman; Comte de Dion, M. Morris Binder and Eugene Sartaiand. Committee having immediate charge of races is the regular racing committee of the Automobile Club of France.

Starting Place—On the Bois de Vincennes, near Lake Dumesnil.

Rules—The racing rules of the Automobile Club of France.

May Contests—The competition for the month of May will be trials that will demonstrate the action of the motor, the amount of fuel consumed and the comfort and the ease of operation of the automobiles. The course for each trial will be laid out from the starting point in Paris for the morning out and return equal to 50 kilometers, and for the afternoon 100 kilometers in the same way. The automobiles taking part in this contest will be entered in four classes, those weighing more than 400 kilograms and carrying two persons, those weighing more than 400 kilograms and carrying four persons, those of equal weight but carrying six persons, and those of the fourth class carrying more than six persons. The speed will be limited to the legal speed of twenty and thirty kilometres per hour. Five daily trials will be required. The prizes are works of art of considerable value.

The dates just announced are May 14, 15, 16, 18 and 19.

June Contests—June 14, the international race between the representative clubs of the different nations. Prize, the Gordon Bennett cup.

Trials of commercial vehicles, cabs and delivery wagons. These vehicles will be continued through five days of the week in which they are to take place. The delivery wagons are to carry a load of 1,200 kilograms.

July Contests—In this will be shown the finest types of automobiles that have ever been brought together. The competition will be for all vehicles, according to the classification given in the rules of the Automobile Club of France for last year. It will take place under special provisions yet to be made. The vehicles will be run during one week, Thursday excepted. There will be five heats of from 300 to 400 kilometres each, starting and finishing at the Pont de Joinville. The carriages will start out in trial from the grounds of Vincennes to the Pont de Joinville, from which point the departures will be timed. On the finish carriages will be timed at the Pont de Joinville and from there will pass to the track of Lake Dumesnil, of which they will make two circuits. Semaphores will be established at the track and will announce the arrival of the carriages.

Prizes—In this contest the nine prizes aggregate 30,000 francs, of which the first prize is 8,000 francs.

August Contests—The contests between automobiles weighing under 400 kilograms, either motor cycles or voiturettes, will probably come off during August. These will carry two persons, either tandem or side by side. The course will probably be the same as for the July races. The seven prizes for light carriages aggregate 9,000 francs, of which one-half is to the winner. The five prizes for motor cycles amount to 8,000 francs, 2,000 to the first, 1,200 to the second, etc.

September Contests—The trials of light deliveries, petite poids as they are called, will take place in September. The merchandise carried in these trials will be 100 kilograms. There will be five daily trials of 50 kilometres each, there being two starts and return from the starting place.

October Contests—The heavy weights will be tested during October. Competing automobiles will be entered in one of three classes. The first includes vehicles for carrying passengers in considerable numbers, the second goods wagons capable of carrying loads above one ton in weight, and the third goods wagons capable of transporting loads of 1,250 kilograms. Trials daily during the week of a distance of 50 kilometres.

(A kilometre = .62 + miles. A kilogram = 2.2 lbs.)

Here and There.

The Automobile Congress at Paris, July 9-13.

Milwaukee is to have two automobiles for its fire department, if a resolution introduced in the city council passes.

At the Trianon Theatre fire in Paris the automobile fire engine rendered valuable assistance. Its speed is about 12 miles an hour.

It is reported that Col. Astor has ordered an automobile station wagon to be used between Rhinecliff station and Rhinebeck.

The Speedway bill, excluding automobiles from the drive along the river bank above New York City, has passed the Assembly.

Automobiles as Hearses.—"I hear they are using automobiles as hearses now!" "Yes, people are just dying to ride in them."—Exchange.

The West Park Board of Chicago has refused the application of Jefferson Jackson to run automobile omnibuses on the west side boulevards.

A motor race between Kenneth A. Skinner and Albert Champion has been arranged to come off in a short time, probably the present month.

An automobile 'bus line is proposed between Chattanooga and Walden Ridge, Tenn., and the Walden Ridge Automobile Co. has been incorporated.

A new white metal is being marketed by an English firm for automobiles under the name of Amazon metal. It is furnished in sheets or for bearings, etc.

Storage batteries on the lines of the Chicago El. Tract. Co. have made an average record of 23,000 car miles, which is considered very good from an engineering point of view.

One of the novelties at the fair of the Independent Hose at Corning, N. Y., was the raffle of a steam phaeton. It was a feature well patronized outside of the city as well as at home.

To encourage inventors and builders of automobiles using alcohol, a prize of a thousand francs has been offered by a French club to the winner in a race between such automobiles.

The mail wagon illustrated in the January number of THE AUTOMOBILE, according to a recent report, is being successfully used in delivering packages, etc. It covers 36 miles daily.

The Gardner gasoline motor, described in the L'Ingenieur Francais, has four cylinders, and in its operation one or more cylinders may be used. By this method the power of the motor is very economically varied.

Automobiles that are to be used outside of the United States by owner can, by a recent ruling, be readmitted through the custom house, duty free. The automobile is classed under "household effects" in order to secure this ruling.

Mr. Albert G. Spalding, of New York, has been appointed director of athletics to the United States Commission to the Paris Exposition. He is now preparing a complete list of the athletic events in connection with the exposition.

The heavy demand for horses for use in South Africa has caused an increase in the number of automobile delivery wagons on English streets. A correspondent of a London paper says these automobiles have been found much more economical by the tradesmen using them.

Steel balls used in such large quantities at the present time for bearings can be made automatically in a machine devised by a Cleveland engineer. The steel cubes are fed in at one part of the machine and from another the perfect spheres roll out.

For the automobile best adapted to army service Emperor William of Germany has offered a prize of $20,000. This offer of a prize has been made upon the excellent showing of the army automobiles which have been tried during the past few months by the officers of the German army.

Beconnais recently raced against time on the Parc d'Acheres. The one kilometre from a flying start was made in 44 4-5 seconds, which is at the rate of 52 miles an hour. Two kilometres were made in 1 minute 42 1-5 seconds. The course for the two kilometre run was unfavorable, as it was traversed by a temporary tramway.

In commenting on the lack of horses for Squadron A, called out during the recent strike near New York City, a daily paper says: "This state of affairs is disgraceful and ridiculous. State headquarters should realize that while horseless street cars and horseless carriages are all very well, horseless cavalry is a worse than useless absurdity."

Mr. Alexander Winton and family sail on the City of Rome, Saturday, May 5th, for Europe. Mr. Charles B. Shanks, secretary of the Winton Motor Carriage Co., is also a member of the party. The automobiles have gone forward and will be made ready on the arrival of the party for the trials that will precede the race of June 14th.

The bill to provide a good road fund by a levy of five-tenths of a mill by the county commissioners has become a law in Ohio. New roads when constructed will be paid for by the abutting property owners twenty-five per-cent. and the balance, seventy-five per cent., from this fund.

The New York State engineer asks for bids on three sections of roads in Westchester county of 3.77, 3.06 and .6 miles, respectively; in Ulster county one piece of road 5.66 miles; in Herkimer county of 1.11 miles; in Albany county of 1.04 miles; in Chemung county 2.6 miles, and in Monroe county of .66 miles.

It has been found that on macadam roads where the finer top dressing of the road is worn away the horse's iron shoe picks out the stone. Narrow iron-tired wheels will also crowd out the stone when once they are exposed and ruts soon result. Rubber tires have the opposite result, and the automobile so equipped is a road builder instead of a road destroyer.

The first consignment of automobiles for the Honolulu Automobile Co. of Honolulu, H. I., left the factory of Woods Motor Vehicle Co. last month. This company has built a charging station and will keep on hand a variety of automobiles for public service. The company's affairs are under the management of Mr. L. T. Grant, who made a thorough investigation of the automobile stations and service while in America last fall.

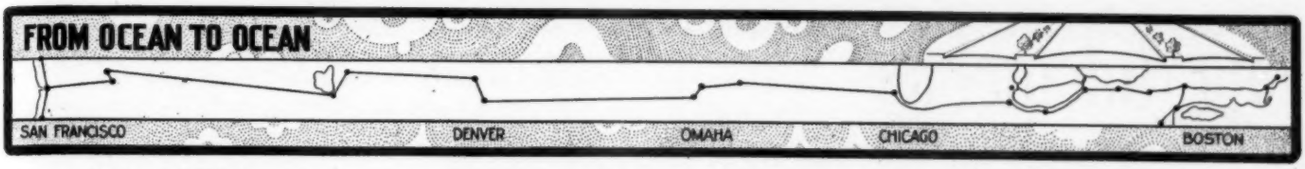
Le Velo continues to keep a record of the horse, bicycle and automobile accidents in France, and proposes to add the accidents due to railways. The last report shows 757 accidents due to the horse, 23 to the automobile and 43 to the bicycle during the month. One of the latter caused the death by drowning by the rider being thrown in the Seine. From the list of accidents due to the horse there resulted 57 deaths and from the bicycle 4

The inventor is usually a busy man, for no sooner does he perfect an invention than he must devise a machine for making it. A contemporary of France reports that owing to the introduction of the automobile the price of mushrooms has gone up. The inventor of the automobile, in order to retain the favors of the public, is expected to invent a new method of growing mushrooms cheaply.

Great interest is taken in the automobile for army use in France. A paper read at Lyons recently by Lieut. Humber upon this subject proved very interesting. He compared the various systems of propulsion and described particularly the automobiles now used by the French army in Senegal. The chief use of the automobile in the army is the transportation of supplies to points away from the railroads. Automobiles are being considered for Madagascar.

Sixty Miles by Electric.

Mr. F. S. Pusey, of the General Electric Automobile Co., recently made a run from Philadelphia to Atlantic City in an electric automobile on one charge of the battery. The battery used is said to be a regular battery, and not a special.



National Highways.

At the formal dinner tendered Major-General Miles and his associates of the National Highways Commission by the Automobile Club of America, at the Waldorf-Astoria, the first of last month, a number of interesting speeches were made. Mr. George F. Chamberlin, acting president of the club, held the close attention of the club with the following short address:

"This club has always, from its very organization, recognized that the future use of the self-propelled pleasure vehicle in this country will be largely a question of good roads. The charter of the club expressly provides that one of its principal objects and purposes shall be 'to promote and encourage in all ways the construction of good roads and the development and improvement of highways.' The club is proud that it has been able already to awaken some public sentiment along this line, its first official publication having been entitled 'A Plea for Good Roads.' When, therefore, it was proposed that the first dinner of the Automobile Club of America should be in honor of the distinguished gentlemen composing the commission, who are to make a report on the project of a transcontinental highway, every member felt that our association, of all others, was most vitally interested in the magnificent enterprise. We would not suggest to whom belongs the honor and credit of having proposed so great and so glorious a plan as the proposed roadway. The author of a recent and most inspiring article on the national highway modestly disclaimed any originality for the idea. As early in our country's history as 1800 a small beginning was made in the actual construction of a system of national highways. But the advent of the railroad and subsequent financial difficulties put an end to the splendid plans of our forefathers. The year 1900 now witnesses the beginning of a new movement toward the realization of the vast and magnificent project which we are to informally discuss this evening. The commission here tonight is freely giving its time to the serious consideration of the various problems involved, and its report will mark the first important step in this great enterprise."

Major-General Miles said that everyone who knows the history of the country knows that the great continental railways were not built altogether for commerce, but to develop the ties that bind the west to the east. The great continental railways were constructed to establish order and to provide that each state should be a part of one great country; they were built not alone for commercial interests, but for the higher, grander and glorious purpose of welding the east to the west. He also said that later rather than now it would be appreciated that the transcontinental highway was an enterprise of much more importance than the making of a good road for automobiles, bicycles and farm wagons. It would in after years assume the proportions of a patriotic achievement. He spoke of the benefits to be derived by the farmers and the driving public generally. While the highway will be national in character, he continued, it does not necessarily follow that Congress must appropriate the money necessary to build it. The Legislatures of the several states through which the roads pass can enact laws appropriating money for the construction and maintenance of the roads within the boundaries of their respective states, the termini to connect with the highway built in the adjoining states. Thus the maintenance of the road would be a matter of state as well as national pride, and, besides adding to the attractiveness of the country, would be of general benefit to the state and its inhabitants. In several sections of the country there are roads already constructed which could form a part of the general system, and, wherever possible, these have been introduced in the plans thus far perfected.

Among the other speakers were ex-Mayor W. L. Strong, Isaac B. Potter and Col. John Jacob Astor.

Report of the National Highway Commission.

Resolved, That the route presenting the most feasible line for a national highway from the Atlantic to the Pacific seems to your committee to be between the fortieth and forty-second parallels of latitude. This embraces Boston, from which the route could be stretched east to Portland, Me., then Albany, reached by a great highway from New York, Philadelphia, Baltimore, Washington, Richmond, Charleston, Savannah and St. Augustine. From Albany running west through Syracuse, Rochester, Buffalo and Niagara Falls, through Erie, Pa., Cleveland and Toledo, Ohio, Adrian and Coldwater, Mich., Elkhart and South Bend., Ind., from Chicago, Ill., to Davenport, Ia. Des Moines and Council Bluffs, Ia., through Omaha, Lincoln and Hastings, Neb., starting across the Rocky Mountains at Denver, reaching Salt Lake and thence southwestwardly to Sacramento and San Francisco, a southern line reaching thence to Los Angeles and a northerly one to Portland, Ore., and Seattle, Wash.

Resolved, That in view of the military importance of such a highway and of the advantages to those sections through which it would be built, and, furthermore, in view of the example in good road building it would give to the people of the twenty-five states and territories through which it would pass, the matter be brought prominently to the attention of the people of the twenty-five states and territories concerned, in order that Congress may be petitioned to authorize the preliminary surveys required for such national highway; providing, if possible, for the completion of the survey of the section between Boston and Chicago the first year, that between Chicago and Omaha the second year, that between New York and St. Augustine the third year, and the remaining sections within the following year.

Resolved, That it be suggested to the petitioners to prepare the completion of the national highway by the appropriation for one-third the expenditure required from the Congress of the United States, one-third by the states for those portions lying within their respective boundaries, and one-third by the counties, towns and cities through which the road shall pass; while the owners of all property benefited be asked to donate the right of way.

It is the further opinion of this committee that in view of the rapidity of motion which science is substituting for the slower forms of roadway travel, and in view of conditions which many recent tests upon the great highways of France and England have already made clear, two points should be kept in mind with reference to construction; first, ample width, and second, the avoidance of curves. One hundred and twenty feet is shown in the boulevard which Massachusetts has built, leading out of Boston, to be not too great a width. One-half of this width might be built in the first instance, but by all means should the entire right of way be secured. The impossibility of avoiding collisions between carriages moving rapidly around curves calls attention to the necessity for long, straight lines in a way that did not present itself in the earlier days of highway engineering.

Severe Tests.

During the last heavy fall of snow two automobilists of Albany took out a steam vehicle to see what they could do with it. They did not fit it out with snow shoes, but they wound each tire with rope. It took some time and some yards of rope, but when completed they started out. A few of their friends had heard that they were to go out, and got sheltered positions near the stable, not expecting the automobile would go far. The rope or the engine, or both combined, soon took the automobilists out of sight. One great drift, however, was too much for it, and the vehicle was stalled. The snow had to be tramped down around it and the automobile backed out. After being out about two hours the automobile returned, looking like one great snowball.

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The State of New Jersey constructed during the year 1896 fifty miles of public road; during the year 1897, seventy miles of improved public roads; during the year 1898, eighty-five miles, and during the year just ended one hundred and sixteen miles of public road. The appropriation for the present year is $150,000.

First Club Race.

Automobile road racing has been inaugurated in America. The first club race held on the fourteenth of last month was a good starter, and more will follow. While the time made was not up to the French standard, it is considered very good. The course selected was a fair stretch of macadamized road with a few grades, two railway tracks and several bridges, and the turn in the street at the twenty-five-mile point required all to slow down. On this day there was a strong west wind that shortened the time somewhat. The event was especially interesting as the first event of the kind held in America. It is also interesting to note that there were three kinds of motive power competing, and each was represented among the three first arrivals. The trophie for which the members of the club competed was presented to the club by Mr. Blanchet, a member of the Automobile Club of France, to whom all automobilists are indebted for his fraternal assistance in inaugurating this club sport in this country.

Automobile Training Schools.

In one or two cities of America and in several foreign cities are to be found automobile training schools. Places where the novice can be instructed in the handling of an automobile and can practice until sufficiently skillful to be trusted on the public streets. A thoroughfare, and particularly a prominent one, is hardly the place for a beginner to take his first lesson, however skillful his instructor may be. This has been brought to public attention by several accidents that have occurred. As far as could be learned, it was through no fault of the automobile, but with the driver. The time is undoubtedly ripe for more schools of this kind, and those that are open should make the fact known.

Decision of Judge Sutherland.

The extracts from the decision of Judge Sutherland to be found in another column will be read with interest by horse owners as well as automobilists. The opinion given states very clearly the grounds for the decision, according to which automobiles have a right to travel on the public highways and are not to be held responsible for damages resulting from horses becoming frightened, unless there be contributory negligence. If the conveyance be practical for the purposes of travel, without producing an unusual amount of noise or steam, it has a right to the use of the public highway. He shows that horses may take fright at conveyances that have become obsolete as well as those more recently introduced, yet one would not think of bringing an action against the driver of a prairie schooner or an ox team at which one's horses had become frightened. In passing upon the statute against the use of any vehicle propelled by steam in public streets, except on railroad tracks, unless a person is sent at least one-eighth of a mile in advance to warn travelers of its approach, he considers it as applied only to the traction engine, a cumbersome, noisy affair, and not to the automobile. By training the horse has become accustomed to the locomotive, the electric car, the bicycle, and will shortly become accustomed to the automobile. In conclusion, the Judge very concisely points out that the temporary inconvenience and dangers incident to the introduction of these modern and practical modes of travel upon the highway must be subordinate to the larger and permanent benefits to the general public resulting from the adoption of the improvements which science and inventive skill have perfected.

Automobile Stage Lines.

While the steam and electric railways occupy at the present time certain fields in the transportation of passengers, there seems also a place for the automobile which does not encroach on the former. It would be foolish to predict that either would be outclassed in its present domain by this more recently developed form of locomotion. That each is destined to retain its present position by virtue of unquestioned advantages in its particular field is the opinion of a number of competent engineers. The great usefulness of the automobile will be found in services supplementary to those systems of transportation so firmly established. Trials of automobile stages made since the first of the year and recent legislation in New York State would indicate that such vehicles will soon be in active service. The omnibus and carette are decidedly behind the times and disfigure any street. The automobile that is to replace them, although it has not made its appearance, will undoubtedly add to rather than detract from the appearance of the street on which it is used. While it thus displaces old and antiquated methods it will furnish a service far superior to its predecessor. As the good roads reach out from and connect city with city the automobile omnibus will extend its field of usefulness. The railway service described in last month's issue is another important automobile institution. Station transfers and omnibus service will soon be monopolized by the automobiles. Companies for operating automobile stages are reported daily from many parts of the country, and inquiries for information show the general interest in this form of the automobile.

Around the World.

To make a trip around the world was the ambition of many of the early cyclists, and quite a number succeeded in its accomplishment. The vivid narratives of the successful riders, the reports of the difficulties encountered, of the dangers threatened, and in one or two instances the complete disappearance of the cyclist consoled many for their inability to undertake the work of "circumcycling" the globe. To the enthusiastic automobilist this idea is peculiarly fascinating, and it is already the ambition of a number to be the first to

accomplish the feat of making a trail around this sphere in an automobile. The various kinds of vehicles are being carefully studied as well as the routes of travel with the facilities for procuring supplies.

Of the three kinds now in successful use the gasoline is the only one open to consideration for such a trip, on account of the small quantity of supplies required. An automobile specially constructed, as simple as possible, with extra fittings for such parts as are most apt to be broken or worn, with large reservoirs for supplies, capable of taking on at such points as may be required a camp equipment for the occupants, and be as light as consistent with strength, would be required. Above all the automobilist should be thoroughly familiar with his machine and skillful in its operation. The expense of such a trip would necessarily be considerable.

French Races.

The automobile races to be held in France this summer will attract a large number of Americans. A few have signified their intention of taking their automobiles with them and seeing France at a 20 to 30 kilometer speed. In motor cycle racing several Americans will participate, and in the great club races of June 14 American racing automobiles will be represented. The races and contests of automobiles are so distributed during the summer and early fall that at whatever time a person may visit Paris some part of the program can be witnessed. The preliminary program of these contests will be found on another page.

The National Government and Good Roads.

While the effort is being made to secure an appropriation from the national government for the construction of improved roads and to undertake under the direction of United States engineers road building, the work the government has done and is now doing for good roads should not be overlooked. Government representatives have been sent to attend the many good roads conventions held in the various States, where lectures and sample pieces of roads constructed by the government have helped to arouse the people directly interested to an appreciation of improved roads. The government has also distributed a great deal of literature on the subject among farmers and other persons to whom the subject might appeal. One of the schemes for improved roads being experimented with by the government and to which some space is given in the report recently issued by the highway commission of the State of New Jersey is the use of iron tracks for vehicles. For localities where the usual material for road construction is not at hand, this plan is deemed the best substitute. While this work aids greatly in the promotion of good roads, yet the help of the general government in a substantial and systematic way is necessary to bring the highways of this country up to the standard which the older European nations have established.

Co-operation for Success.

Farmers, merchants, wheelmen, automobilists and the public in general are benefited by the construction of suitable roads throughout the country. The press and public, the friends of good roads everywhere, can do a noble service by bringing to the attention of our representatives in Congress the need of better roads in the interior of our country. For a half century the railroads have had a great influence in Congress; at intervals the possibility of war with a foreign power as well as the wars in which the country has been actually engaged has influenced our representatives to secure its favorable consideration for the navy; and the idea of leaving road building to the individual States has worked to the disadvantage of our public roads. These as well as other causes must account for the present and past diffidence of our national government toward the highways of the country. While certain of the States have entered upon a systematic plan for the improvement of the roads within their borders, other States can be induced to take up the work only by the hard and persistent efforts of the friends of good roads. When the government shall have taken up the report of the National Highways Commission, the friends of good roads should strive through their representative to secure its favorable consideration. It is only by the united effort of those benefited that the assistance of the general government can be secured. It is a small matter to write your Congressman and urge his assistance, but it will help to accomplish the desired end.

Tours and Shows.

The thousand-mile tour now in progress in Great Britain cannot fail to be of great value to the industry. It is a grand object lesson, instructive to the people through which it passes and of the cities and towns where the exhibitions are held on the automobilists' arrival. It helps to demonstrate the practical nature of the automobile and proves more conclusively than any verbal argument the growing importance of the industry. To the builders and users the records kept of the operation of the automobiles on this tour and a comparison of the various styles and motive powers will prove beneficial. The automobile is hardly taken seriously, as yet, by a great many people. Such tours as the above will help to change these unbelievers.

Will They Be Better?

It seems to be a quite common opinion that automobiles are going to be cheaper and better. The opinion of those now building automobiles, however, does not coincide with the above. What seems to be the favorite argument with those advancing this opinion is that such has been the history of the bicycle. The bicycle is a comparatively simple piece of mechanism, and differs greatly in this respect from the automobile. There is no more reason for accepting its history as an example of what the history of the automobile is to be than that of the locomotive, the electric street car or the steamboat. History already tells us that prices have advanced. First-class carriages cannot be bought for one or for two hundred dollars, and we cannot expect that an electric automobile which is not only the fine carriage but many times more, to be proportionately less in price. In the construction of the electric carriage we cannot look for any radical change. The electric motor has passed through its experimental period and drives to-day thousands of different machines. It has reached, so far as is possible, mechanical perfection. As applied to the automobile it is the same mechanism adapted to this particular use. The means for its control is simple and the most perfect of any system. The storage battery, while modified to this particular use, has been the subject of close study for the past fifty years. If any radical change is to occur we have no premonition of the direction from which it is to come. The steam automobile with its boiler, engine and furnace, is in principal the same as we have had with us in other uses for many years. The improvements that will come will be in the auxiliary appliances and for more perfect regulation of the power. In the third form of automobile, the gasoline type, probably more changes are generally expected than in either of the others. American builders have already eliminated the objectionable features of the foreign machines of this class. Good serviceable automobiles of this class are in the market, and a reasonable price is asked. That, however, is the case with all well-constructed articles, and the automobile is no exception. It may be that other forms of energy may be utilized in the automobile, but of this we have no assurance at the present time. The person who desires an automobile that will meet as far as possible the requirements of such a vehicle can find it now on the market. One difficulty is that it cannot always be delivered on the day the purchaser makes up his mind to buy one. It has been necessary to order some time in advance, and although premiums have often been offered builders usually stick to the rule "first come first served." The history of the person who looks for something better is told in the following paragraph:

Once upon a time a man saw a bicycle for the first time. "Ah," said he, "I will have one of those when they are improved." Long years elapsed, and when the pneumatic tires and other improvements came he said: "They will be better yet," but when motors came in he said, "this is better, and when they are perfect I will have one." Poor man, he waited patiently for a "perfect" means of travel, but last week he was carried in a horse-drawn hearse to his last resting place. Thus, by waiting for the perfect article, he got nothing. There are many like him.

Opinion of Judge Sutherland.

On October 18 last, as Mr. Jonathan West, the owner of an automobile was riding on the street in Rochester, N. Y., a horse hitched at the roadside belonging to Fred. Mason became frightened at the approaching automobile and ran away. judgment was obtained against Mr. West in a lower court, which is now reversed in the following opinion:

The horse has no paramount or exclusive right to the road, and the mere fact that a horse takes fright at some vehicle run by new and improved methods, and smashes things, does not give the injured party a cause of action. As Judge Cooley says in Macomber vs. Nichols, 12 Mich., 212: "When the highway is not restricted in its dedication to some particular mode of use, it is open to all suitable methods, and it cannot be assumed that these will be the same from age to age, or that the new means of making the way useful must be excluded merely because their introduction may tend to the inconvenience or even to the injury of those who continue to use the road after the same manner as formerly." If the defendant's motor carriage is practicable for the purpose of travel, and the noise and vapor caused by its use are kept within reasonable limitations and are no greater than are fairly incident to the use of motor carriages which are found adapted to the needs of the general public, then I cannot see how the defendant can be held liable in the absence of evidence that at the particular time complained of the carriage was operated carelessly.

If one should find it desirable to go back to primitive methods and trek along a city street with a team of ox team and wagon of the prairie schooner variety, it would possibly cause some uneasiness in horses unused to such sights. Yet it could not be actionable, in my opinion, if a runaway should result, provided due care were shown not unnecessarily to interfere with the use of the highway. Horses may take fright at conveyances that have become obsolete as well as at those which are novel; but this is one of the dangers incident to the driving of horses, and the fact cannot be interposed as a barrier to retrogression or progress in the method of locomotion. Bicycles used to frighten horses but no right of action accrued. (Holland vs. Bartch, 120 Ind.; 46 Thompson vs. Dodge, 58 Minn., 555.) Electric street cars have caused many runaways. Automobiles operated by steam without storage batteries or by gasoline explosion engines, running at a moderate speed, may cause fright to horses unused to them; yet the horse must get used to them or the driver take his chances.

The evidence in this case shows that defendant was running his motor at a moderate rate of speed, and as it approached the horse he slowed up. Defendant and his wife, who was with him, say they came to a full stop before the horse started to run, but this is contradicted by plaintiff's witnesses who admit slackened speed.

It will not do to say that it is proper to run any kind of a contrivance upon the street in which persons may be carried. A machine that would go puffing and snorting through the streets, trailing clouds of steam and smoke, might be a nuisance, but this is not such a case. It cannot be said that the defendant's machine is such a departure in its construction or mode of operation from other steam motor carriages which experience has lately shown to be entirely practicable for street use, as to make it a nuisance, although because of the present novelty of horseless carriages horses may take fright at its approach. There was no proof of an unusual amount of vapor escaping at the time of the accident, nor of any amount of noise greater than is ordinarily heard in running a machine of that character, and to sustain this judgment is to condemn the defendant's motor carriage and all others operating in a similar way, and to declare them impracticable and unfit for use upon the streets.

There is a statute against the use of any vehicle propelled by steam in public streets (except on railroad tracks) unless a person is sent at least one-eighth of a mile in advance to warn travelers of its approach. (Highway law, sec. 155; Penal Code, sec. 640, sub. 11.) This statute, though broad enough to cover the motor in question, was passed before automobiles were in use, and it was directed against traction engines, which are ponderous and noisy affairs and have been the cause of much litigation. (Mullen vs. Glens Falls, 11 App. Div., 275.) The provision of law that the forerunner must precede the steam carriage for at least an eighth of a mile shows that it was not drawn with steam automobiles in mind of the kind used in this case; and if a man had been sent that distance ahead it would have been of no value to plaintiffs as a warning, for their driver would not have met him, so it cannot be said the accident occurred because of defendant's failure to comply with the law referred to.

The temporary inconvenience and dangers incident to the introduction of these modern and practical modes of travel upon the highway must be subordinate to the larger and permanent benefits to the general public resulting from the adoption of the improvements which science and inventive skill have perfected.

The judgment appealed from is reversed.

Correspondence Department.

Space will be given on this page to letters concerning the Automobile, its operation or construction, to accounts of tours or runs, routes of travel, good roads, etc. Discussion of subjects concerning the Automobile is solicited. When requested by correspondents their names will not be published, but must always be given in the communication to the Editor.

WYLIE PERMANENT CAMPS.
YELLOWSTONE NATIONAL PARK.

Bozeman, Montana, April 2, 1900.

Editor THE AUTOMOBILE:

Dear Sir—You will notice by the enclosed folder that I do a transportation business in the Yellowstone National Park. I have been watching with much interest the development of the automobile, hoping that it would soon reach that state of perfection and form of construction that would render it practicable for use in the Yellowstone. I have not yet seen a form of horseless vehicle that we can use there. What we should have is a conveyance which will carry 12 or 15 passengers, and will be able to work over 7% grades. The trip around the Park is about 150 miles in length. Captain Chittenden, of the Engineer Corps of the Army, who now has charge of the road building in the Park, is constructing the roads with a view to their use by the automobile, as fast as he can. We look to this mode of conveyance to suppress the "dust nuisance" in the Park.

Hoping that we may soon see representations of something that will be suitable for work in the National Park, I am,

Very cordially, W. W. WYLIE.

Philadelphia, Pa., April 21, 1900.

Editor THE AUTOMOBILE:

Dear Sir—The item entitled "A Question of Speed," in your last issue, interested me, and I would like to see the subject discussed. If the question of speed is really one of brakes, which I firmly believe it is, does it follow that the best brake is one that will instantly stop the wheels from going around? D. D.

New York, April 18, 1900.

Editor THE AUTOMOBILE:

Dear Sir—I notice in the current issue of your journal a communication from B. F. F. on the imperfections of a short wheel base. He might also have mentioned the imperfections of odd gauges for automobiles, and the still odder notion of making the gauges of forward and rear wheels different. On city streets the imperfections of such a vehicle are not so apparent, but on an unimproved country road, which an automobilist is always liable to find, they are forced upon him vigorously. You want to avoid the ruts, and at the same time that ridge in the center that our equine friends pile up with their hoofs, but are finally obliged to give it up and take everything as it comes. H. B.

Brooklyn, N. Y., April 16, 1900.

Editor THE AUTOMOBILE:

Dear Sir—Please inform me through the columns of your paper the name of the builder of the "Duryea," and oblige,

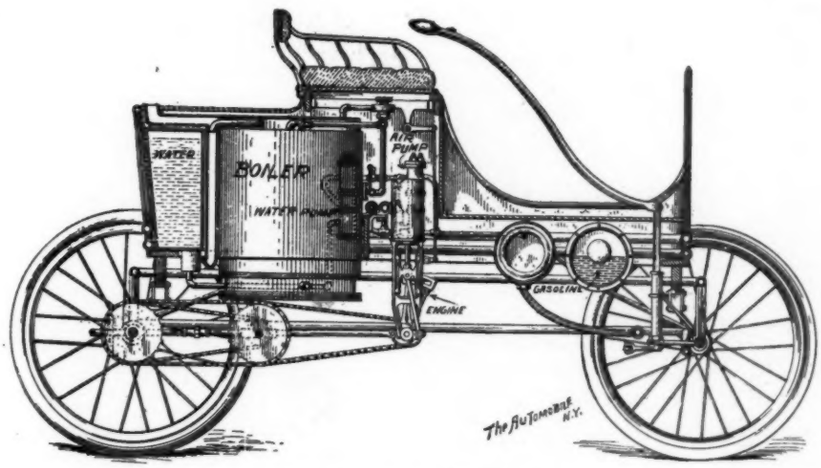
C. W. TRAVIS, D. D. S.

A.—Duryea Manufacturing Co., Peoria, Ill.

The Overman Steam Automobile.

The steam automobile perfected by Mr. A. H. Overman, of Chicopee Falls, Mass., possesses several interesting and novel features. The manner in which the driving mechanism is covered strikes one on inspecting this vehicle. The body is made entirely of metal, which is enameled. A portion of this body is composed of two thicknesses, and the ribs that form the boundaries of the panels by this method form an opening for tubes that encircle the vehicle. This is shown in the sectional cut given herewith.

The frame of the running gear is composed of steel tubing which is so fitted that it affords a circulating system for the exhaust steam that finds its way after encircling the vehicle into the second of the two cylinders in the forward part of the vehicle. Connection from the frame to this system is made through the flexible tube shown. The frame is a truss both in front and rear, and in the center of the



OVERMAN STEAM AUTOMOBILE.

divided rear axle is mounted the differential gear with sprockets on circumference for the driving chain. From each side of this gear extends an arm to the driving shaft of the engine. The connection is sufficiently flexible to allow a slight movement of these arms. The steering arrangement is after the usual American method.

The location of the boiler is shown. This is a tubular boiler, and a hood over the top conducts the gases of combustion to the rear opening shown, but which is covered by a neat top with side openings. This flue also extends downward just back of the boiler, and into this space a pipe leads whereby the exhaust steam may be forced through the flue. The water tank surrounds the boiler on three sides. At the rear there is a depression from which a pipe leads to the pump which automatically forces the water into the boiler when the water in boiler gets below a certain point. The burner using ordinary gasoline is placed directly beneath the boiler. The gasoline is contained in the forward tank. The pipe from this enters the second cylinder and the gasoline passing through the coil here is heated by the exhaust steam. An air pump working automatically keeps the pressure in the gasoline tank about constant.

The supply of gasoline to the burner is also automatically regulated by the boiler pressure. As soon as the pressure reaches a certain point a valve actuated by the movement of a diaphragm reduces the flow to the burner. As the pressure falls the valve is opened and the flow is increased. By suitable connections the air pump is used to inflate the pneumatic tires. The water level in boiler and tank is shown by gauges placed in the side of body. Electric lamps are so located that these can be made visible at night by pressing the button on the steering handle.

The engine, which is a double cylinder slide valve pattern, is suspended by a movable point shown just back of the cylinders. Through this joint the exhaust as well as the live steam passes. This one point of suspension with the arms holding the crank shaft afford an ingenious method for preventing strains on the driving gear in any of the awkward positions in which the vehicle may be placed.

The engine is operated by two levers at the right of the driver, the one governing the admission of steam and the other the cut off and reversal. By a very ingenious method when the operator desires to leave his automobile the levers are automatically locked in place so that the inquisitive small boy cannot start it.

A Trolley Automobile.

A novelty in the automobile line, but not an automobile in the accepted meaning of the word, has been devised by a French engineer, M. Lombard-Gerin. This vehicle, with its propelling devices, overcomes many difficulties of previous inventors. The vehicle carries a standard from which leads the cable to a trolley traveling by a separate motor along two wires suspended from poles at the roadside. This small motor is driven by current from the vehicle motor so that it moves only when the carriage is in motion.

There are six conductors in the cable leading to the trolley. Connection is made by swivel joints so as to permit the carriage to turn in any direction. An experimental line about a half mile long has been built by the inventor, on which to test the appliances. There are certain difficulties in the use of such a system of traction that seem as yet unsolved. The passage of vehicles going in the same or opposite direction, the complicated character of the appliances and first cost and expense of maintenance might be mentioned.

The Automobile Voltmeter.

As it is necessary to know how much electricity we have stored up, and how fast this is being consumed, we use a combined volt and ampere meter. I think at this point it would be well to explain that the difference in pressure between a fully charged storage cell and the same discharged, is about three-tenths of a volt, being two volts at the beginning and 1.7 volts at the end of the discharge. With 40 cells, the pressure at the start is 80 volts, which falls gradually to 68 at the finish. These meters are therefore marked in this manner—opposite 80 volts the word "charged" is written and "discharged" against 68. You can therefore spin along at ease until, while running on a level stretch of road at a normal discharge, your meter reads 75 volts. You know then that you have used half your charge, and that you must either return or find some means of recharging. This device has been in constant use for over three years, and I have never known anyone to run out of a charge if they went by the reading of the meter. I have so far explained only one side of the meter, and how it operates on discharge or the running of the carriage. It has still another function. When a storage battery is connected to a source of current to be recharged, the back pressure of a cell is about 2.1 volts, making the 40 cells require 84 volts to recharge them. As they absorb the charge, their pressure gradually rises to 2.5 volts per cell, or 100 volts for the 40 cells, at which pressure the charging should be stopped, as the battery is full. The meter also indicates this condition. As it is also necessary to know at what rate to recharge the cells, the other half of the instrument is graded in amperes. This portion of the meter has a double scale, reading either the amount of going into or out of the battery, enabling us to charge at the proper rate for the best results to the battery, and when running, shows the amount of power being used. It is therefore possible with an electric carriage, and one of these meters, to know at any time just what horse-power you are developing.—Abstract from a recent address of Mr. A. L. Riker.

Gas Engine Power.

The actual power generated by a good gas or oil engine should be about 0.89 indicated horse-power per 100 revolutions per minute per 100 cubic inches of piston displacement. An engine having 100 cubic inches of piston displacement and running at slightly over 900 revolutions per minute, would develop 7½ brake horse-power. Such an engine should be capable of propelling a vehicle weighing 1 ton at a suitable speed under very poor conditions.

Tests of Air Cooled Motors.

Reports of a test of an air cooled motor recently made by Mr. Chas. Sangster are as follows. Ten minutes' run; tests taken at first, fifth and tenth minute. Speed of motor between tests 1,700 to 1,800 revolutions. No load between tests:

	Revolutions.	Weight in pan.	Bal.	B. HP.
First minute....	2,090	12 lbs.	0.5 lbs.	2.33
Fifth "	1,900	12 "	.5 "	2.11
Tenth "	1,765	12 "	.25 "	2.01

Ten minutes' run; tests taken at first, fifth and tenth minute. Eleven and a half pounds in pan carried through whole run:

	Revolutions.	Weight in pan.	Bal.	B. HP.
First minute....	2,095	11½ lbs.	0.25 lbs.	2.28
Fifth "	1,780	11½ "	.75 "	1.85
Tenth "	1,710	11½ "	1.5 "	1.65

These tests were made in a shop with an ordinary temperature. A slight blast from a pipe was allowed to play on the cylinder, but this artificial cooling would not be equal to that of rapid movement of the motor through the outside atmosphere of say 65° temperature at say twenty miles an hour.

Rules of the Road.

Vehicles should keep to the right, and not only so when passing other vehicles going in the opposite direction, but always to the right, and as near the right hand curbstone as vehicles at a standstill or going at a slower rate of speed will permit, thus leaving room in the middle of the street for those going in the same direction at a greater speed to pass to the left.

A vehicle turning into a street to the the right should turn the corner as near the curb as practicable, and keep on to the right in the street into which it turns.

A vehicle turning into a street to the left should turn around the centre of intersection of the two streets.

A vehicle crossing from one side of the street to the other should do so, when going to stop, headed in the same direction.

In slowing up or stopping, a signal should always be given to those behind by raising the hand.

In turning, a signal should be given by raising the hand with a motion in the direction in which the turn is to be made.

Test of Water Coolers.

There have been many devices for cooling the water of the gasoline motor cylinder and the cast pipes with the wide flanges presenting a large surface to the atmosphere, the wrought pipe with the stamped plates for the same purpose, and the iron-wound pipes such as have been introduced by Messrs. Clarkson & Capel. Mr. Clarkson recently made some tests of the last two kinds with the results given below.

The main object was to determine their heat-dispersing or cooling efficiency from the point of view, principally, of the weight of metal in the different arrangements. When the air was circulated at a speed of eight miles per hour—this he deemed the most interesting condition, as representing the actual state of things when the car would be travelling upon the road. The results obtained are indicated in the following tables, which have been calculated to show the number of British thermal units of heat got rid of in one hour in each case; also the percentage of efficiency per pound of metal in coolers, and per foot of tube:

TABLE I.

Description of tube.	Thermal units per lb. of metal in coolers pr hr.	Percentage efficiency per lb. of metal in coolers.
Tube with corrugated plate gills, ⅝-in. diameter....	866.32	100
Clarkson tube, ½-in. diam..	2,558.8	295
" " ⅝-in. " .	1,916.4	221
" " ¾-in. " .	1,274.0	147

TABLE II.

Description of tube.	Ounces of water condensed per foot. per hr.	Perc'tage of water per ft. of tube.
Tube with corrugated plate gills, ⅝-in. diameter.....	15.00	100.00
Clarkson tube, ½-in. diam..	18.75	125.00
" " ⅝-in. " .	19.9	132.6
" " ¾-in. " .	21.7	144.6

From the above it will be seen that the one-half inch Clarkson tube is the more efficient as regards weight, but the larger sizes radiate more heat.

Opening the Exhaust Valve.

Mr. Boon, an automobilist of London, who has noticed the effort made in starting a motor cycle by the pedals in forcing the piston against the air in cylinder when there is no means of opening the exhaust, has devised a cheaply attached and simple method by which the exhaust valve of a De Dion motor, as fitted to a tricycle, can be opened without removing the hand from the handle-bar—in itself an additional advantage. This Mr. Boon effects by fixing two small levers formed by stout sheet steel, one on each side of the exhaust guide, and hinged at one end to the socket of the crank chamber. The other ends are attached to the tension wire in a Bowden brake wire conduit, the hand lever actuating same being attached to right side of the handle-bar. The steel plate levers pass one on each side of the exhaust guide, and when the Bowden hand lever is actuated the tension wire raises the exhaust guide levers and the exhaust guide is lifted, thus opening the exhaust valve.

The Automobile a Blessing.

What seems likely to be almost the complete absence of flies in out cities is one of the chief blessings that will result from the coming of the horseless age, says Dr. Walsh in a paper recently read before a society of physicians.

Because the common house fly is so disagreeable we have got into the way of thinking that he is useful. There is no certainty that he is really the scavenger we call him. What is more certain is that he carries diseases with him—that he spreads bacteria.

Now, insects have their favorite places for lighting, their places for laying eggs. These places are carefully chosen. The butterfly seems to circle around and light on any flower. As a matter of fact, he goes to one particular flower. These things are never the result of chance. It is a scientific fact that the common house fly lays eggs in horse manure, and in this the eggs flourish prodigiously. With the horse off our streets the fly must follow him. It will not be where the horse is not. Thus what has been proved a serious channel of infection will be done away with.

With no horses, or few of them, another danger largely disappears—the blowing about of dried manure. When this manure is moist it is not dangerous, but once dry it can blow about everywhere and carry germs directly into households. Instead of being ventilated from above, where the air is purest and freest from contagion, our buildings are ventilated from below. Some houses that I know of are arranged the other way, but they are very few. Were it not for the horses in the cities a large part of the street cleaning of to-day would be unnecessary. Much contagion comes from this source. Under these new conditions it will be avoided.

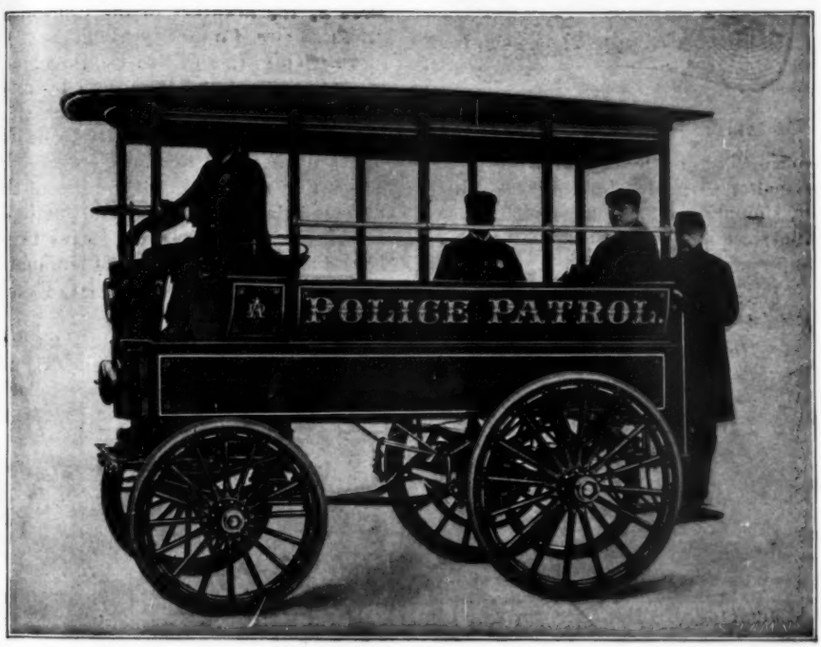
The bacillus of tetanus is often carried to the cities in hay or straw. With no horses, and consequently little importation of this fodder, the tetanus bacillus would seldom have a chance to appear here. A bacillus that proves even more dangerous on the whole, is one of the varieties of the colon bacillus. This finds a good breeding place in the intestinal tract of the horse, and while its presence does not affect the horse at all, once released it is the bacillus that is instrumental in bringing on all choleraic disorders, especially in the cases of very young children. The spread of bacteria such as these, according to this physician's theory, is most widely accomplished by the horse.

The Street Car Employees' Union, of Cleveland, O., will soon have its first automobile 'bus ready for trial. This automobile is being built by a company composed of the former employees of the Cleveland Street Railway Co., and it is the intention to operate a line of self-propelled omnibuses in competition with the street railway lines.

An Automobile Patrol.

The automoble has recently entered a new field of public service at Akron, O. This city boasts of the first automobile patrol wagon, and is quite up with the times in the equipment of the police department. This automobile was designed by F. P. Loomis, of Akron, and the wagon was built under his supervision. It is complete in every particular, and will probably open the way for automobiles in other departments.

The power is furnished by a storage battery which drives the two four horse-power electric motors. The controller is next the dash, and steering is by means of hand wheel acting on a segmental gear attached to the fifth wheel. The wagon is equipped with headlight, gong, etc.; the size of body is ten by four feet four. Two sets of brakes are fitted to the vehicle, a hand brake acting on friction pulley on rear axle, and a shoe brake acting on the rubber tires of rear wheels.



AN AUTOMOBILE PATROL.

The weight of this automobile, with batteries that are concealed beneath the seats, is 5,500 pounds. The batteries are charged from the city power circuits. The automobile seems especially adapted for city service, which is not continuous but has often long periods of rest. The expense of operation is proportional to the use made of it, and there are no horses that require feed and cost whether in use or not.

Don't grease your tires. It has been found that oil and grease are injurious to rubber tires. Consequently if the bearings and parts of your automobile are inclined to throw oil on the tires put on shields so as to protect the tires. They will last longer if taken care of.

Automobile Design.

Among the records of the patent office are to be found a large number of designs for automobiles. While many are novel in the plan of the running gear quite a number call especial attention to the method of suspending the carriage body and the motor mechanism. Several include a double suspension, a plan giving separate springs to the support of the occupants. One or two employ two sets of springs for supporting the body. A light and a heavy set are used to withstand the light and heavy shocks respectively. The same purpose is aimed at where heavy springs support the carriage, and the cushion is fitted with springs which absorb the lesser jars. The plan of mounting the driving mechanism on the running gear entirely free of the body is employed by one or two companies. Whether this plan possesses any advantages is open to question. The motor and its attendant appliances require some protection from the rough jars and shocks that they would receive if mounted directly on the running gear. Where the driving mechanism is mounted in the body on elliptical springs another problem presents itself, that of preserving a uniform distance between rear axle and the driving shaft. One of the methods of accomplishing this is illustrated on another page of this issue.

Club Runs from New York.

The committee on club runs has decided on the following dates for runs: May 5th, to Babylon; May 19th, West Point; June 2d, Philadelphia; June 16th, Bernardsville, and June 30th, Asbury Park. For Babylon the rendezvous is Astor Court, 8.45, and on the run to Philadelphia the start will be made at 7.30 A. M., returning the following day.

First Hydrocarbon Automobile.

The specifications on which a patent was granted in 1886 describes what is called the first spirit motor carriage in the world. This carriage is now among the collection of automobiles and kindred devices at the works of Benz & Co., at Mannheim, Germany. It has its motor in a horizontal position with flywheel in the horizontal plane. Both belts and sprocket wheels with chains are used.

Vienna Races.

Races from Munich to Vienna via Salzbourg, are being arranged by the automobile clubs of Austria and Bavaria for May or June. At the close of the race it is proposed to hold an exhibition at Vienna. The participants are entered in three classes: Racers, touring automobiles over 800 pounds, voiturettes under 800 pounds, and motor cycles.

Army Automobiles.

The war department of Italy has taken up the subject of the automobile for the use of artillery by ordering for the purpose of making tests three models of automobiles. One is to be a light, swift carriage for dispatch service, another a light petroleum motor automboile carrying a Maxim rapid-fire gun, and the third will be a heavier automobile for carrying large field pieces.

Rights Restored.

The Park Commissioners of San Francisco have modified their recent decision against automobiles in Golden Gate Park, and now allow automobiles on the south drive to the ocean. The automobilists appreciate this concession, but look forward to a more favorable attitude toward self-propelled carriages on the part of the commissioners.

New Motor Cycle.

A motor bicycle that reminds one of the one built by Werner Frerer & Co., illustrated in a previous issue of this paper, has been brought out by M. Pernoo, 114 Rue Oberkampf, Paris. The lower horizontal tubes of the frame are extended to the rear so as to support the motor, which drives the rear wheel in the same manner as in the above mentioned vehicle the forward wheel is driven.

Increased Demands for Automobiles.

Everywhere in the streets one sees evidence of the constant increase in the number of automobiles—they are doubling, quadrupling, becoming the fad and rage of the hour. They have come to stay, too, and if any one were to ask for evidence of the great popular growth of the horseless carriage it is to be found easily. Not only is ocular demonstration at hand, but the great factories of the country are being plied with orders that cannot be filled readily, owing to contracts already placed. —New York Herald.

AUTOMOBILE TIRES—Continued

Cushion Tires.—The pneumatic tire is liable to be punctured, and to avoid this inconvenience inventors have devised tires that are non-puncturable. The Lattina cellular tire, made by the Rubber Tire Co., of

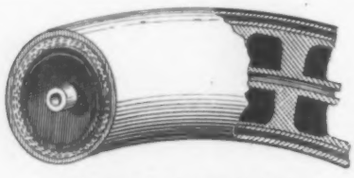


FIG 9—THE LATTINA TIRE.

Philadelphia, has instead of one large central chamber a large number of air spaces, as illustrated in the accompanying cut. The rubber discs, which are the partitions between the air chambers, form a more rigid elastic medium, but at the same time a very flexible one. The tire for a runabout is an inch and a half in diameter, and it is

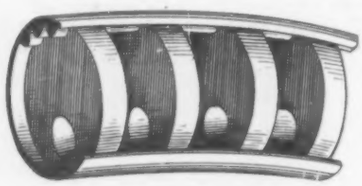


FIG. 10—THE WONDER TIRE.

easily attached to any wheel with a crescent channel. Lugs bolted through the felloe are used to secure it. No special tools are needed. The tire is stretched over the wheel, the lugs fastened, and the tire is ready for use. No pump is ever required.

The Wonder tire, made by th Wonder Tire Co., of Chicago, belongs in non-puncturable tire class. This tire is made up of a heavy tube in which are perforated

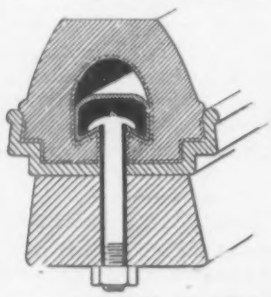


FIG. 11—THE DUCASBLE TIRE.

discs placed at regular intervals. Lugs in the tread of the tire keep them separated, and they are also vulcanized to inner surface. It is claimed that this tire will not cling to the pavement nor slip when wet.

The Ducasble tire made by the Manufactured Rubber Co. of Philadelphia is shown in section in Fig. 11. This tire consists in a rubber strip, having a void interior space and an exterior section of special shape. This tire is held firmly to the rim by means of an annular segment, fitting into the moulded form of the tire, and bound by means of tee-bolts through the felloe of the wheel between the spokes. It is guaranteed not to be torn off and it is

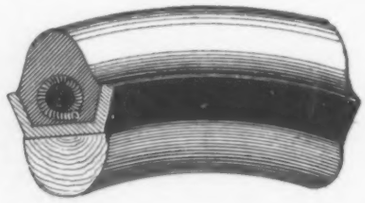


FIG. 12—THE LATIMER TIRE.

claimed will not side slip. It is a very simple matter to put on this tire, and its repair, should a part be cut, is also an easy matter, as a new section can be inlaid.

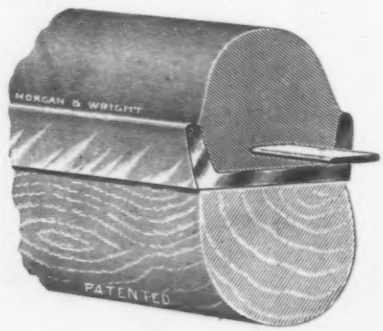


FIG. 13—MORGAN & WRIGHT TIRE.

Still another form of cushion tire is that of the Latimer Rubber Tire Co., of Chicago. A spiral spring which is itself wound in a spiral is imbedded in the rubber about the central air chamber of this tire. The elasticity of the spring and rubber are combined, and aside from this a very dur-

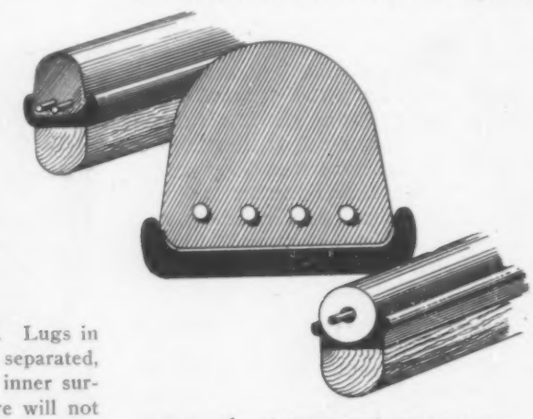


FIG. 14-16—CONSOLIDATED RUBBER TIRES.

able tire is the result. This tire is made in sizes from seven-eighths to three inches.

Solid Tires.—Solid tires, as a rule, are secured to wheel in a steel channel, and several forms of channels are used by different builders. In Fig. 13 is illustrated the steel band solid tire built by Morgan & Wright. In placing the tire on the wheel the two ends of this band are drawn together and riveted. The opening in the tire through which this band passes is somewhat larger than the band, so that there is no binding of the rubber about the band. This band when secured is perfectly rigid and holds the tire securely.

Another solid tire is built in numerous sizes by the licensees of the Consolidated Rubber Tire Co., of 40 Wall St., New York. This style of tire is also mounted in steel channel and is secured by one or more steel wires, according to the size of tire. The light round tire has one wire, the oval tread two or more.

The illustrations show the form of three different sizes of this tire and method of securing to the wheel. The heavy tire for trucks and the larger class of automobiles presents a broad base and a large surface of rubber.

A solid tire quite similar to the preceding, but differing in several points, is made by the Victor Rubber Tire Co., of Springfield, O. The tire is not intended to fit

FIG. 18—THE EASY TIRE.

FIG. 17—THE VICTOR TIRE.

closely at the top of channel, but is of such a form as to prevent checking and breaking over edge of channel, as sometimes occurs.

While as a general rule solid rubber tires are built in one piece, there are exceptions. One of these is the tire of the Whitman & Barnes Mfg. Co., of Akron, O. This is built up of a rubber base fitting the steel channel and having a center groove for the tire itself. A steel wire passes completely through the tire, and when joined holds both parts of tire in place. This tire has been in use a number of years on vehicles and has been styled the "easy."

The New England tire, as it is called by its manufacturers, the International Automobile & Vehicle Tire Co., is also of the solid rubber type. While the tread of this tire is narrow, the channel is broad, so that under compression the rubber lies within the channel. The method of fastening to channel is peculiar to this tire. Through

an opening in tire a steel tape is passed, and the ends are secured by a bolt head, drawing them into a recess in channel. The bolt is secured by washer and nut on under side of felloe. As the bolt is drawn

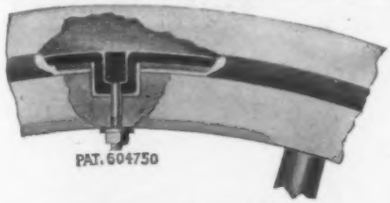
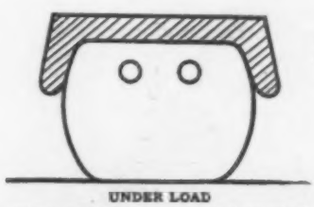


FIG. 19—NEW ENGLAND TIRE.

down by nut the steel band is tightened and held securely in position. Creeping is prevented by this method of attachment. That position of the tire between band and channel is held dead, placing all the flexibility between tape and top of rubber.



FIGS. 20 AND 21—LANGMUIR TIRE.

The Langmuir automobile tire made by the Revere Rubber Co. of New York is also a solid rubber tire. Its design is shown in the cross sectional illustrations. The broad channel in which is placed the tire with an equally broad base but leaving V-shaped spaces at sides, accommodates the tire under compression. This is one of the important features, since free play is given to the elasticity of the tire. It does not bend over edges of tire, which is a frequent cause of deterioration. The method of fastening is suggested by cuts, and an outfit for applying these tires is sold by this company.

The tire illustrated herewith in Fig. 22 is a combination pneumatic and cushion. The thick covering with small central

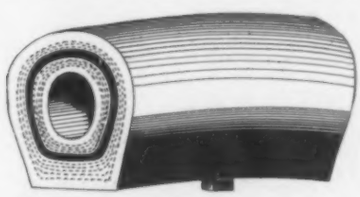


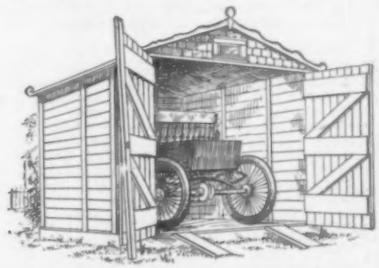
FIG. 22—THE KEMPSHALL TIRE.

opening has sufficient strength on the broad base to carry a heavy vehicle when tire is not inflated. It is designed especially for automobiles, carriages and delivery wagons. The inner section of tire is composed entirely of rubber, and is re-enforced by the several thicknesses of fabric. Next comes a cushion of rubber, which absorbes the motion of the separate members of tire produced by the compression. This is surrounded by several layers of fabric, which are thoroughly filled with the rubber that composes the heavy outer covering of the tire. An automobile company using these tires say that none of the vehicles using these tires has ever been laid up on account of a puncture. One of the tires has made more than three thousand miles deflated. The tire is made by the Rubber Tire Co. of America, New York. The tire is fastened to rim by means of the brass lugs which are inserted in the tire during the process of manufacture.

New Appliances.

PORTABLE AUTOMOBILE HOUSES.

Portable automobile houses are the latest addition to the list of automobile supplies placed on the market. These are made in movable sections of finished white pine, which when erected are securely fastened together with bolts and screws. It does not require a carpenter or a



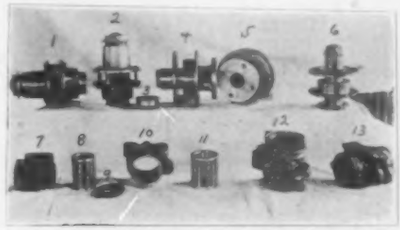
PORTABLE AUTOMOBILE HOUSES.

hammer. A screwdriver and wrench are required for putting up and taking down these houses.

They have good pine floors to keep the vehicle off the ground and dry. A window at the front over the doors provides ventilation. If desired, the walls and roof may be doubled to keep the house cool in summer and warm in winter. The weight is not great, and, as it is built in sections, can be easily transported when going to a summer residence. Where the fire restrictions are particularly stringent this house provides an excellent solution for the housing of gasoline. Two sizes of houses are at present built by R. G. Du Bois, of 220 Broadway, New York city, one for a runabout and a larger for a stanhope. The accompanying illustration shows their general design.

BEARINGS FOR AUTOMOBILES.

The accompanying illustrations, Figs. 1 and 2, show Grant roller bearing hubs now being placed on the market by the Automobile Supply Co., 3209 Washington Ave., St. Louis, Mo. In Figs. 4

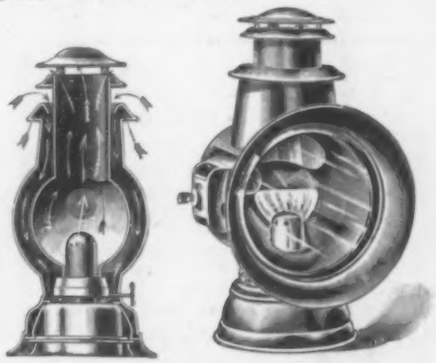


BEARINGS FOR AUTOMOBILES.

and 5 are shown a special hub for rear wheel, and Fig. 3 shows the cap for them. These have brass fronts with steel centers, carefully milled out. This company also furnishes complete running gears ready for wood spokes, or complete with wire or wood wheels. The other views show cast steel bearing cases with hardened rollers for rear axles.

DIETZ AUTOMOBILE LAMP.

Especially designed for the automobile, is the Dietz lamp. Wind or the swift motion of the vehicle will not extinguish it. The sides are double, as shown in the sectional cut. The air is admitted at the top, passing down to the burner and the gases escape from the top. Perfect combustion is obtained and a clear white flame is produced. It burns kerosene.

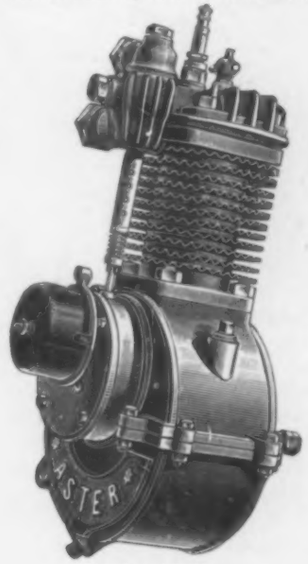


FIGS. 1 AND 2—DIETZ AUTOMOBILE LAMP.

In design it is compact and neat. The front is a beveled moulded lens set in a flaring door. At the back behind the flame is a reflector of rolled silver-plated copper, with a small aperture at the center which throws a point of crimson light to the rear. These lamps are made by the R. E. Dietz Company, of New York City.

THE ASTER MOTOR.

The motor is especially adapted for tricycles and quadricycles. For racing machines, the long list of records made by Aster motors is the most



ASTER MOTOR.

conclusive evidence of its fitness. Such well-know racing men as Becannais, Rigal, Krauss, Wridgeway and Terront have made records and won in races varying in length from one kilometre to twelve hundred kilometres. The Waltham Mfg. Co., of Waltham, Mass., has the American agency for this motor, which is made at St. Denis, Paris.

Automobile Patents Exploitation Company

Undertakes:—The manufacture of Automobiles and Motor-Cycles.
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The Electric Automobile:

Its construction, care and operation. By C. E. WOODS, E. E., M. E. 12mo., 268 pages, illustrated. Price, $1.25. Should be in the hands of every user or owner of an Electric Automobile.

Horseless Vehicles, Automobiles and Motor Cycles.

Steam, Hydro-Carbon, Electric and Pneumatic Motors. By GARDNER D. HISCOX, M. E. Large 8vo., 400 pages. Very fully illustrated. Price, $3.00.

Petroleum Motor Cars.

By LOUIS LOCKERT. 12mo., cloth, illustrated. 1898. Price, $1.50.

Motor Cars.

By A. J. WALLIS-TAYLOR, C. E. London. 1897. Price, $2.00.

Gas Engine Construction.

By HENRY V. A. PARSELL, JR., Mem. A. I. Elec. Eng., and ARTHUR J. WEED, M. E. Large 8vo., about 300 pages. Very fully illustrated. Price, $2.50.

Besides treating of American gas engines in general, there is given complete working drawings of a half horse-power gas engine. Rules are also given for working out the power and sizes of any engine.

Gas Engines.

Gas, Gasoline and Oil Vapor Engines.

By GARDNER D. HISCOX, M. E. 365 pages, 270 illustrations. New York. Price, $2.50.

Contains chapters on engines for automobiles, recently revised and up-to-date

Gas and Oil Engines.

By DUGALD CLERK. Sixth edition. 1896. 558 pages, 8vo., cloth. Price, $4.00.

A Text Book on Gas and Oil Engines.

By BRYAN DONKIN. Second edition, 8vo., cloth. London. 1896. Price, $7.50.

The Automobile and Horseless Carriage Pocket-Book for 1900.

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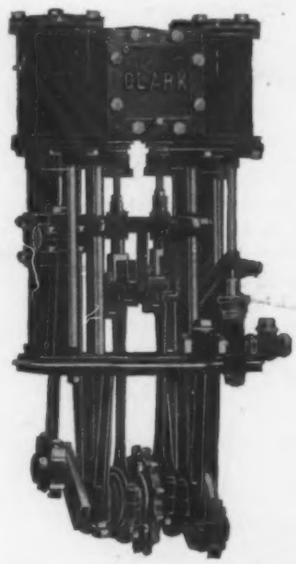
CLARK STEAM CARRIAGE ENGINE.

The double-cylinder, slide-valve engine shown herewith is an improved engine recently brought out by Mr. Edward S. Clark, of Boston, Mass. It is designated as Class B. engine. The cylinders are close grained cast iron. The framing is steel and bronze. The crank shaft, connecting rods, pistons, etc., are forged steel. The valves are



CLARK STEAM CARRIAGE ENGINE.

operated by eccentrics on crank shaft, and are reversed by link motion. The weight of this engine is 40 pounds. The cylinders are 2½, with a 3½-in. stroke. The engine is fitted with a pumping attachment for supplying feed water to the boiler.

Trade Notes.

W. C. Oswald, of Kalamazoo, Mich., is building an automobile which is to be driven by a Buffalo gasolene motor. It is of the surrey pattern with canopy top.

The General Carriage Co. has a number of automobiles in service in New York City. A station is being fitted up on Sixth Ave. between 43d and 44th Sts.

Mr. Kenneth A. Skinner expects to sail for France shortly where he expects to complete arrangements for the manufacture of the De Dion motors in this country.

The new catalogue of the Garvin Machine Co. of New York, will be found of great interest by automobile builders who use labor-saving machinery. The information regarding this class of machinery is very complete.

The New York Electric Vehicle Transportation Co. has opened a salesroom at 541 Fifth Ave., New York City, where all types of Columbia automobiles are exhibited, and where information regarding same can be obtained.

Geo. Hilsendergen, 308 Woodward Ave., Detroit, Mich., has undertaken the sale of automobiles, having secured the addition to his present holdings the store at the above address, which will be used exclusively for the display of these vehicles.

The Quick Manufacturing Co. has just moved into a more commodious factory at 3, 5 and 7 Oliver St., Newark, N. J., having been located for some time in Paterson. The new building gives the company larger and better facilities for the building of gasolene motors and appliances.

Electric delivery wagons are presented in a recent pamphlet issued by Woods Motor Vehicle Co., of Chicago. An extensive line is shown in the very clear illustrations with which the pamphlet is filled. Wagons for business houses and retail stores form but a part, and mail, express wagons, etc., are shown.

The Duryea Power Co., of Reading, Pa., has lately increased its capital to $100,000, and has moved into permanent quarters at North River and Hockley Sts. Here they have 10,000 feet of floor space, well lighted, ample power, with testing ground for their vehicles in the rear, and anchorage for their launches on the canal in front. The officers of the company are Herbert M. Sternbergh, president; Chas. E. Duryea, vice-president; Henry Millholland, secretary and treasurer, and their goods are being built under license from the Duryea Mfg. Co., of Peoria, Ill.

Trade Notes—Continued.

The Electric Vehicle Co. has paid a regular quarterly dividend of two per cent.

It is reported that the Lewis Motor Vehicle Co., of Philadelphia, is to go into liquidation.

The Illinois Automobile Co. has moved into its new quarters, 45 Hubbard court, Chicago.

It is proposed to establish an automobile stage line between Visalia, Exeter and Lindsay, Cal.

Colonel Dodge, President of the Single-Tube Automobile & Bicycle Tire Co., is now in Paris.

The E. R. Thomas Motor Co., of Buffalo, N. Y., is to build automobiles operated by gasolene motors.

The Anglo-American Motor Co. and the British Motor Coupe Co. were recently incorporated at Dover, Del.

A franchise has been granted the New York Electric Vehicle & Transportation Co. to operate automobiles on any of the streets of New York City.

Rufus Wright, of Morgan & Wright, died last month in Chicago. He had been engaged for the past twenty years in the manufacture of rubber tires, etc.

A patent, granted by the British patent office recently, is for a method of applying a cooling liquid to the brake pulley of an automobile when the brake is applied.

The Sill Motor Co., of Toronto, exhibited an electric automobile through its agents, Shippey Bros., at the International Exhibition of Automobiles, held at Agricultural Hall, London, April 18th.

The Chicago Automobile Co. contemplates the building of gasoline automobiles, and has secured a factory at Harvey, Ill., a suburb of Chicago. This company was recently incorporated for $1,000,000.

Among the new charging stations for automobiles is one at Newark, N. J., which is provided with every facility for charging the electric batteries. It is at the Mechanics' St. Station of the People's Light & Power Co.

Catalogue describing the gasoline motors of the Crest Mfg. Co., of Dorchester, Mass., has been recently received. It describes the application of the motors to carriages, tricycles and quadricycles. Illustrations and prices are given.

The new factory of the National Automobile Co. at Indianapolis, Ind., is going up rapidly and will probably be roofed this month. The machinery will be ready to go in and it will be but a few days before the wheels will be turning.

The Otto Gas Engine Works, of Philadelphia, contemplates adding an automobile gas motor to its already extensive lists of products. The high standing of the stationary motor of this type is a guarantee of excellence for the new motor.

The Oxford Automobile Co., of Boston, Mass., announces in a pamphlet its advent in the automobile industry. The automobiles are operated by steam power, and the engine and boilers are those that have been perfected by the firm of Milne & Killam, of that city.

A very neat and attractive pamphlet has just been issued by the Maltby Automobile & Motor Co., of 10 Clinton st., Brooklyn. Motors and parts are very clearly illustrated, and their construction and operation is described. Some very good pointers on what "don't" do are given.

That part of the Boston Gear Works catalogue relating to chains, gears and pinions will be of particular interest to automobile builders. The company has recently moved to the corner of Purchase and Pearl Sts., Boston. A special folder on compensating bevel gears has been issued for the automobile trade.

Phineas Jones & Co., of Newark, N. J., are very busy at present in the manufacture of their well-known wheels. This concern is one of the oldest makers of wheels in the country, and one of the first to take up and make a specialty of wheels for automobiles. Their goods are the standard among many of the leading automobile builders.

The incorporators of the Century Automobile Co., of Syracuse, N. Y., are Chas. F. Saul, president; Chas. Listman, vice-president; Chas. A. Bridgeman, secretary-treasurer; H. C. Plumb and William Van Wagoner, manager. A number of these gentlemen will be recognized as having been prominently connected with the bicycle industry of Syracuse. The company has already produced nine styles of electric, gasoline and steam automobiles.

The catalogue, at hand, of the Riker Electric Vehicle Co., of Elizabethport, N. J., illustrates a variety of automobiles. The engravings are very finely executed and the typographical work is of a high order. The different parts of the motor equipment of the electric vehicle are very clearly shown, and the advantages of this class of vehicles are well presented in the accompanying text. It is a handsome catalogue and will undoubtedly prove an able salesman for the company.

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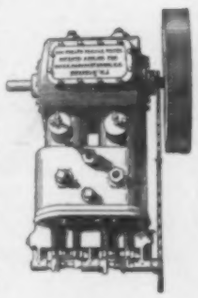

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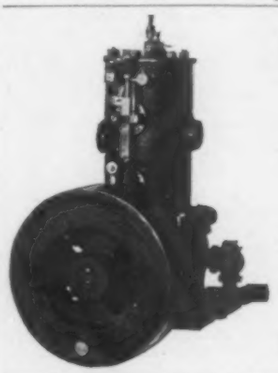

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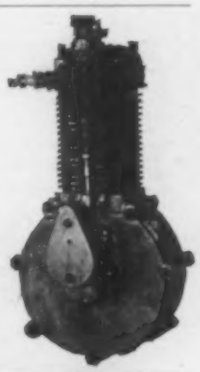

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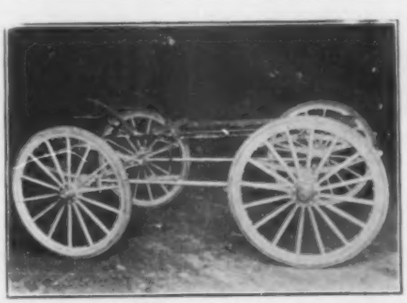

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New Books.

THE ELECTRIC AUTOMOBILE; Its Construction, Care and Operation. By C. E. Woods, E.E., M.E., Herbert S. Stone & Co., Chicago, 1900. 12mo; 177 pages; illustrated. Price, $1.25.

An interesting description of the electric automobile that will be found very useful by every owner or prospective owner of an electric automobile. Being written by one of the pioneer builders of electric vehicles, the various features of the automobile are admirably treated. The work is void of technical nomenclature without which the author has succeeded to a wonderful degree in presenting the subject. That portion relating to the care and handling of the electric vehicle will be found very useful by those who operate electric automobiles.

ANNUAIRE GENERAL DE L'AUTOMOBILE, 1900. Paris, France. F. Thevin & Ch. Houry, 21 Rue du Louvre. 8vo; 1,200 pages. Price, postpaid, 10 francs.

The rapid development of the automobile industry has created a demand for a list and addresses of those connected with the industry. The chief among the annual publications is that announced above, now in preparation for 1900. The work is divided into four parts. The first is devoted to the builders of automobiles giving name, address, kind of vehicle made, etc., for Europe and the United States. The second part gives similar information concerning the makers of parts, supplies, etc. The third gives information especially of assistance to the tourist for it gives hotels, repairmen, dealers in supplies, for the automobile, etc. The last division of the book is devoted to lists of clubs, associations, lists of members, rules and general information. Persons or companies interested should send their address or business card to MM. Thevin & Houry, 21 Rue de Louvre, Paris. No charge is made for inserting name and address under proper heading.

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Patents.

Lists of Automobile patents granted during month of April.

644,731—Vehicle Tire Armor. [illegible] to R. Cousins.
644,613—Tire for Bicycles or Other Vehicles. Issued to W. Lenard Foote.
644,843—Automobile. Issued to A. Bink.
644,853—Motor Vehicle. Issued to E. Fahl.
644,590—Self-Propelled Vehicle. Issued to H. A. Frantz.
644,598—Motor Vehicle. Issued to C. O. Heggem.
644,950—Motor Driven Vehicle. Issued to Thornton & Lea.
32,326—Design for Electric Motor Case for Automobiles. Issued to C. A. Lindstrom.
645,640—Storage Battery Cell. Issued to R. N. Chamberlain.
645,902—Motor Gearing. Issued to E. A. Sperry.
645,844—Vehicle Tire. Issued to C. T. Adams.
645,926—Brake for Vehicles. Issued to P. D. Blackden.
645,628—Brake for Vehicles. Issued to L. L. Fletcher.
645,903—Motor Vehicle Brake. Issued to E. A. Sperry.
32,366—Design for Storage Battery Plate. Issued to J. B. Conrad.
32,367—Design for Underslung Battery Frame for Vehicles. Issued to H. S. Baldwin.
34,351—Trademark for Motor Cars, Carriages, and Parts of Same. G. Daimler.
34,350—Trademark for Pneumatic Tires. Morgan & Wright.
646,325—Battery Jar or Receptacle. Issued to E. A. Sperry.
646,320—Carbureter. Issued to J. R. Selzer.
646,399—An Explosive Engine. Issued to J. F. Duryea.
646,322—Explosive Engine. Issued to C. Sintz.
646,282—Hydrocarbon Motor. Issued to E. T. Headech.
646,081—Automobile Gearing. Issued to E. A. Sperry.
646,193—Vehicle Running Gear. Issued to A. P. Robinson.
32,408—Design for Vehicle Motor Casing. Issued to F. A. Phelps.
646,923—Cellulose Envelope for Storage Battery Element. Issued to E. A. Sperry.
646,780—Carbureter. Issued to W. H. Wood.
646,477—Motor Carriage Driving Gear. Issued to R. E. Twyford.
646,501—Carriage Brake. Issued to McLoughlin & Schmidt.
646,894—Storage Cell. Issued to H. J. Cogswell.
646,700—Steam Engine Indicator. Issued to W. Houtaling.
646,552—Storage Battery. Issued to G. W. Gesner.
646,922—Storage Battery. Issued to E. A. Sperry.
646,709—Pneumatic Tire. Issued to F. A. Sieberling.
646,641—Vehicle Brake. Issued to J. Ferrel.
646,803—Vehicle Driving Mechanism. Issued to E. Childs.
646,751—Vehicle Wheel. Issued to R. Mulholland.
647,244—An Automobile. Issued to J. C. Anderson.

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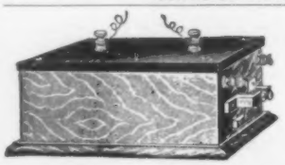

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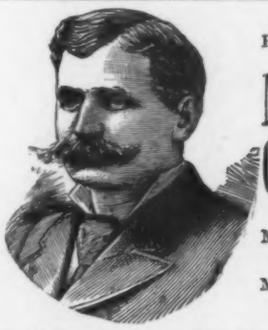

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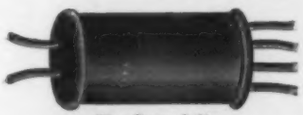
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